

What is claimed is:

1 1. A bi-directional shift-register circuit for
2 outputting data in different turns according to a low-
3 voltage clock signal, a first directional signal and a
4 second directional signal, comprising:

5 a first shift-register unit having a first-stage
6 input terminal, a first-stage output terminal,
7 and a first-stage clock input terminal for
8 receiving the low-voltage clock signal;

9 a second shift-register unit having a second-stage
10 input terminal, a second-stage output terminal,
11 and a second-stage clock input terminal for
12 receiving the low-voltage clock signal;

13 a third shift-register unit having a third-stage
14 input terminal, a third-stage output terminal
15 and a third-stage clock input terminal for
16 receiving the low-voltage clock signal;

17 a first bi-directional control circuit having a
18 first input terminal coupled to the first-stage
19 output terminal, a second input terminal
20 coupled to the third-stage output terminal, and
21 a first control terminal; the first bi-
22 directional control circuit outputs the signal
23 of the first-stage output terminal to the
24 second-stage input terminal when the first
25 control terminal receives the first directional
26 signal and outputs the signal of the third-
27 stage output terminal to the second-stage input

terminal when the first control terminal receives the second directional signal;
a first level shifter coupled to the first-stage output terminal to amplify the signal of the first-stage output terminal;
a second level shifter coupled to the second -stage output terminal to amplify the signal of the second-stage output terminal; and
a third level shifter coupled to the third-stage output terminal to amplify the signal of the third-stage output terminal;
wherein the second shift-register unit outputs the signal of the second-stage output terminal to the third-stage input terminal when the second-stage input terminal receives the signal of the first-stage output terminal and the second shift-register unit outputs the signal of the second-stage output terminal to the first-stage input terminal when the second-stage input terminal receives the signal of the third-stage output terminal.

2. The bi-directional shift-register circuit as claimed in claim 1, wherein the data is sequentially output by the first shift-register unit, the second shift-register unit and the third shift-register unit when the first control terminal receives the first directional signal.

3. The bi-directional shift-register circuit as claimed in claim 2, wherein the data is sequentially

output by the third shift-register unit, the second shift-register unit and the first shift-register unit when the first control terminal receives the second directional signal.

4. The bi-directional shift-register circuit as claimed in claim 1, further comprising:

a second bi-directional control circuit having a first input terminal coupled to the second-stage output terminal, a second input terminal coupled to a first clock signal, and a second control terminal; wherein the second bi-directional control circuit outputs the signal of the second-stage output terminal to the third-stage input terminal when the second control terminal receives the first directional signal and outputs the first clock signal to the third-stage input terminal when the second control terminal receives the second directional signal;

a third bi-directional control circuit having a first input terminal coupled to a second clock signal, a second input terminal coupled to the second-stage output terminal, and a third control terminal; wherein the second bi-directional control circuit outputs the second clock signal to the first-stage input terminal when the third control terminal receives the first directional signal and outputs the signal of the second-stage output terminal to the

26 first-stage input terminal when the third
27 control terminal receives the second
28 directional signal.

1 5. The bi-directional shift-register circuit as
2 claimed in claim 1, wherein the first bi-directional
3 control circuit comprises:

4 a first logic device coupled to the first-stage
5 output terminal and the third-stage output
6 terminal;

7 a controlling device for outputting the signal of
8 the first-stage output terminal or the signal
9 of the third-stage output terminal according to
10 the signal of the first control terminal; and

11 a second logic device, coupled to an output terminal
12 of the first logic device and an output
13 terminal of the controlling device, for
14 outputting the signal of the first-stage output
15 terminal to the second-stage input terminal
16 when the first control terminal receives the
17 first directional signal, and outputting the
18 signal of the third-stage output terminal to
19 the second-stage input terminal when the first
20 control terminal receives the second
21 directional signal.

1 6. The bi-directional shift-register as claimed in
2 claim 5, wherein the first and second logic devices are
3 NOR logic gate.

1 7. A bi-directional shift-register circuit for
2 outputting data in different turns according to a low-
3 voltage clock signal, a first directional signal and a
4 second directional signal, comprising:

5 a first shift-register unit having a first-stage
6 first input terminal, a first-stage second
7 input terminal, a first-stage output terminal,
8 and a first-stage clock input terminal for
9 receiving the low-voltage clock signal;

10 a second shift-register unit having a second-stage
11 first input terminal, a second-stage second
12 input terminal, a second-stage output terminal,
13 and a second-stage clock input terminal for
14 receiving the low-voltage clock signal;

15 a third shift-register unit having a third-stage
16 first input terminal, a third-stage second
17 input terminal, a third-stage output terminal
18 and a third-stage clock input terminal for
19 receiving the low-voltage clock signal;

20 a first bi-directional control circuit having a
21 first input terminal coupled to the first-stage
22 output terminal, a second input terminal
23 coupled to the third-stage output terminal, and
24 a first control terminal; wherein the first bi-
25 directional control circuit outputs the signal
26 of the first-stage output terminal to the
27 second-stage first input terminal, and outputs
28 the signal of the third-stage output terminal
29 to the second-stage second input terminal when

30 the first control terminal receives the first
31 directional signal and outputs the signal of
32 the third-stage output terminal to the second-
33 stage first input terminal and outputs the
34 signal of the first-stage output terminal to
35 the second-stage second input terminal when the
36 first control terminal receives the second
37 directional signal;

38 a first level shifter coupled to the first-stage
39 output terminal to amplify the signal of the
40 first-stage output terminal;

41 a second level shifter coupled to the second -stage
42 output terminal to amplify the signal of the
43 second-stage output terminal; and

44 a third level shifter coupled to the third-stage
45 output terminal to amplify the signal of the
46 third-stage output terminal;

47 wherein the third-stage first input terminal
48 receives the signal of the second-stage output
49 terminal and the third-stage second input
50 terminal receives a first clock signal when the
51 second-stage first input terminal receives the
52 signal of the first-stage output terminal and
53 the second-stage second input terminal receives
54 the signal of the third-stage output terminal
55 and the first-stage first input terminal
56 receives the signal of the second-stage output
57 terminal, and the first-stage second input
58 terminal receives a second clock signal when
59 the second-stage first input terminal receives

60 the signal of the third-stage output terminal
61 and the second-stage second input terminal
62 receives the signal of the first-stage output
63 terminal.

1 8. The bi-directional shift-register circuit as
2 claimed in Claim 7, wherein the data is sequentially
3 output by the first shift-register unit, the second
4 shift-register unit and the third shift-register unit
5 when the first control terminal receives the first
6 directional signal.

1 9. The bi-directional shift-register circuit as
2 claimed in claim 8, wherein the data is sequentially
3 output by the third shift-register unit, the second
4 shift-register unit and the first shift-register unit
5 when the first control terminal receives the second
6 directional signal.

1 10. The bi-directional shift-register circuit as
2 claimed in claim 9, further comprising:
3 a second bi-directional control circuit having a
4 first input terminal coupled to the second-
5 stage output terminal, a second input terminal
6 coupled to the first clock signal, and a second
7 control terminal; wherein the second bi-
8 directional control circuit outputs the signal
9 of the second-stage output terminal to the
10 third-stage first input terminal and outputs
11 the first clock signal to the third-stage
12 second input terminal when the second control

13 terminal receives the first directional signal
14 and outputs the first clock signal to the
15 third-stage first input terminal and outputs
16 the signal of the second-stage output terminal
17 to the third-stage second input terminal when
18 the second control terminal receives the second
19 directional signal;

20 a third bi-directional control circuit having a
21 first input terminal coupled to the second
22 clock signal, a second input terminal coupled
23 to the second-stage output terminal, and a
24 third control terminal; wherein the third bi-
25 directional control circuit outputs the second
26 clock signal to the first-stage first input
27 terminal and outputs the signal of the second-
28 stage output terminal to the first-stage second
29 input terminal when the third control terminal
30 receives the first directional signal and
31 outputs the signal the second-stage output
32 terminal to the first-stage first input
33 terminal and outputs the second clock signal to
34 the first-stage second input terminal when the
35 third control terminal receives the second
36 directional signal.

1 11. The bi-directional shift-register circuit as
2 claimed in claim 10, wherein the first bi-directional
3 control circuit comprises:

4 a first switch, having an input terminal coupled to
5 the first-stage output terminal, a first output

6 terminal coupled to the second-stage first
7 input terminal and a second output terminal
8 coupled to the second-stage second input
9 terminal, for outputting the signal of the
10 first-stage output terminal to the second-stage
11 first input terminal when the first control
12 terminal receives the first directional signal;
13 and

14 a second switch, having an input terminal coupled to
15 the third-stage output terminal, a first output
16 terminal coupled to the second-stage second
17 input terminal and a second output terminal
18 coupled to the second-stage first input
19 terminal, for outputting the signal of the
20 third-stage output terminal to the second-stage
21 second input terminal when the first control
22 terminal receives the second directional
23 signal.

1 12. The bi-directional shift-register circuit as
2 claimed in claim 11, wherein the first switch outputs the
3 signal of the first-stage output terminal to the second-
4 stage second input terminal and the second switch outputs
5 the signal of the third-stage output terminal to the
6 second-stage first input terminal when the first control
7 terminal receives the second directional signal.